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Q1 What is hydronephrosis? write in detail its causes, pathophysiology, diagnosis and treatment?

Hydronephrosis is:

Hydronephrosis is swelling of one or both kidneys - kidneys swelling happens when urine can't drain from a kidney and builds up in the kidney as a result. This can occur from a blockage in the tubes that drain urine from the kidneys (ureters) or from an anatomical defect that doesn't allow urine to drain properly.

Causes:

- kidney stone (common cause).
- scarring and blood clots.
- An enlarged prostate gland in men, which can be due to benign prostatic hyperplasia (BPH) or prostatitis.
- pregnancy, which causes a compression due to a growing fetus.
- tumors in or near the ureter.
- A narrowing of the ureter from an injury or birth defect.

Pathophysiology:

Dilation of the renal pelvis & calyces.

Types of hydronephrosis:

- Pelvic type
- Renal type
- Pelvorenal type. most common type.

Symptoms:

- asymptomatic
- pain is felt in the renal area.
- hematuria.
- urinary infection.
- calculi
- azotemia.

Diagnosis:

- Symptoms and signs.
- ultrasound.
- IVO
- cystourethrogram
- cystoscopy
- RGP.
- Delayed empty.
- isotope renography.
- urine culture.

Treatment:

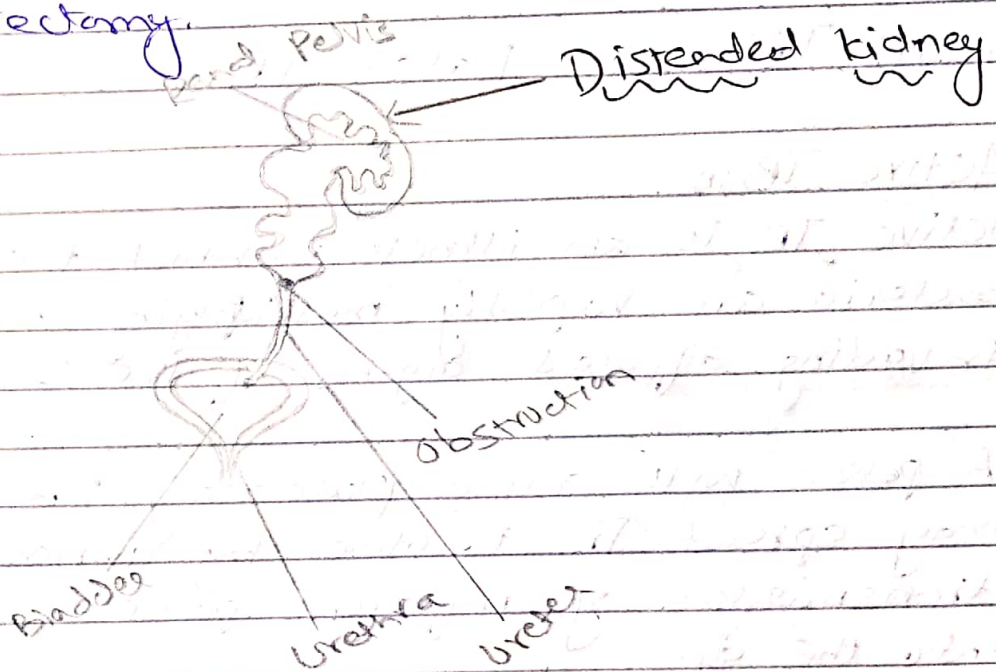
Depends on the cause, site, duration etc.

- 1 U.T.I Antibiotic therapy.
- 2 prompt drainage
- 3 corrected to the cause.
- 4 Relief of the lower tract obstruction.

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Catheter drainage, urinary diversion, indwelling pigtail ureteral catheter.

5 Nephrectomy.



Distended kidney Diagram :-

Q2 Explain in detail the types / categories and pathophysiology of tuberculosis?

TB :-

Tuberculosis is a disease caused by bacteria called mycobacterium tuberculosis. The bacteria usually attack the lungs but they can also damage other parts of the body. TB spreads through the air when a person with TB of the lungs or throat coughs, sneezes, or talks.

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Types of TB

Active TB

Latent TB

Miliary TB

Active TB:

Active TB is an illness in which the TB bacteria are rapidly multiplying and invading different organs of the body.

A person with active pulmonary TB disease may spread TB to others by airborne transmission of infectious particles (coughed into the air).

Active TB is contagious and causes symptoms.

The most common form of active TB is lung disease, but it may invade other organs so called extrapulmonary TB.

Latent TB:

Latent TB occurs when a person has the TB bacteria within their body, but the bacteria are present in very small numbers and do not develop disease. They are kept under control by the body's immune system.

Latent TB doesn't cause symptoms and isn't contagious.

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people with latent TB have a normal chest X-ray and a negative sputum test. It is often only known that someone has latent TB because they have had a TB test, such as the TB skin test.

- However, there is an ongoing risk that the latent infection may turn into active disease. The risk is increased by other illnesses such as HIV or medications which compromise the immune system.

Miliary TB

- Miliary TB is a rare form of active disease that occurs when TB bacteria find their way into the bloodstream. In this form, the bacteria quickly spread all over the body in tiny nodules and affect multiple organs at once.
- Miliary TB causes general active TB symptoms in addition to other symptoms, depending on the body parts involved. For example, if your bone marrow is affected, you may have a low red blood cell count or a rash.
- Its name comes from a distinctive pattern seen on a chest radiograph of many tiny spots distributed throughout the lung fields with the appearance similar to millet seeds - thus term "miliary tuberculosis".
- This form of TB can be rapidly fatal.

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Pathophysiology is

• (initial infection or primary infection)



• Entry of micro organism through droplet nuclei



• Bacteria is transmitted to aveoli through airway's



• Deposition and multiplication of bacteria.



• Bacilli are also transported to other parts of the body via blood stream and phagocytosis by neutrophils and macrophages.

PATHOPHYSIOLOGY is

Mycobacterium



Pulmonary aveoli



Immune system has lodged in (Alveolar macrophages).



Detects presence of pathogen and engulf the bacteria



Mycobacterium bacteria inhibits the macrophages to form phagolysosome and remains protected inside the macrophages.

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↳ PATHOPHYSIOLOGY :

Starts replication inside macrophages.



Primary infection occurs.



Cell mediated immunity gets activated
Surrounds the cell to forms granuloma



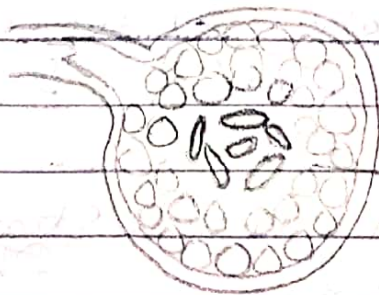
leads to necrosis of tissue at injection
site. (TERMINUS (GONE) FOCUS).



Involve nearby lymph nodes (GONE Complex)



Classification of GONE Complex (LATENT T-B)



→ macrophages and
T lymphocytes act
together to try to
contain the infection
by forming granuloma.

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Q3 How are renal stones formed and what are different types of renal stones? Which radiological procedure is most suitable for diagnosing renal stones?

Renal stones:

Kidney stones form when your urine contains more crystal-forming substances such as calcium, oxalate and uric acid than the fluid in your urine can dilute. At the same time, your urine may lack substances that prevent crystals from sticking together, creating an ideal environment for kidney stones to form.

- renal stones may occur when the urinary concentration of crystal-forming substance (e.g. calcium, oxalate, uric acid) is high.
- The urinary concentration of substance that stone formation (e.g. citrate) is low.

Types of Renal Stones:

• Calcium oxalate stones:

The most common type of kidney stone is a calcium oxalate stone. These result when the urine contains low levels of citrate and high levels of calcium and either oxalate or uric acid. Calcium oxalate stones are linked with foods high in oxalate which is naturally occurring substance in plants and animals.

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• Calcium phosphate stones:

- Calcium phosphate kidney stones are caused by abnormalities in the way the urinary system functions. Your doctor may order a series of blood and urine tests to determine whether any urinary or kidney problems could be causing this type of stone, which often occurs simultaneously with calcium oxalate stones.

• Struvite stones:

- More common in women. Struvite stones form as a result of certain types of urinary tract infections. These stones tend to grow quickly and become large, sometimes occupying the entire kidney. Left untreated, they can cause frequent and sometimes severe urinary tract infections and loss of kidney function.

• Uric Acid stones:

More common in men, uric acid stones tend to occur in people who don't drink enough water or have a diet high in animal protein. They are also more likely to occur in people who have gout, a family history of this type of kidney stone or in those who've had chemotherapy.

• Cystine stones:

Cystine stones are caused by a hereditary genetic disorder called cystinuria that can lead to excessive amounts of the amino acid cystine collecting in the urine. This can result

in the formation of stones in the kidneys, bladder or ureters, which transport urine from the kidneys to the bladder.

Diagnosing:

- Unenhanced helical CT is highly sensitive and specific in diagnosing urolithiasis,

- Blood Tests:

During your initial exam, your doctor may collect a small amount of blood in order to assess your kidney function, look for signs of infection and test for factors that can contribute to the formation of kidney stones. Such as high calcium levels, parathyroid hormone and uric acid.

- Urine tests:

Your doctor may analyze a sample of your urine in order to check for crystals, which can lead to the formation of kidney stones and order a urine culture to determine if you have a urinary tract infection.

3 Ultrasound:

Your doctor may recommend an ultrasound scan to evaluate your kidneys, bladder, and ureters, which are the tubes that carry urine from the kidneys to the bladder. This helps your doctor to check for stones that haven't passed, to monitor

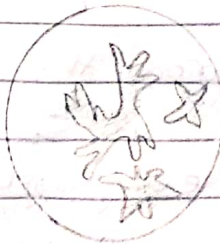
the growth of a stone. and to screen for recurrence. In this test, a handheld device called a transducer is placed on the abdomen and used to produce sound waves create image of the pelvic organs.

- Intravenous pyelogram.
- Retrograde pyelogram.
- Kidney-ureter-bladder X-ray.

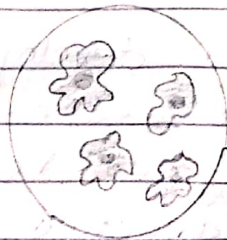
• CT Scan is

Your doctor may use CT scan to look for stones in the kidneys, ureters, and bladder to determine their size and exact location and to evaluate the anatomy of your urinary tract.

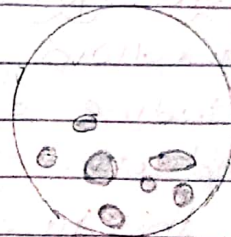
• MRI Scans.



(Phosphate stone)



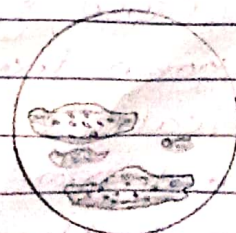
(Oxalate stone)



(Urate stone)



(Cystine stone)



(Xanthine stone)

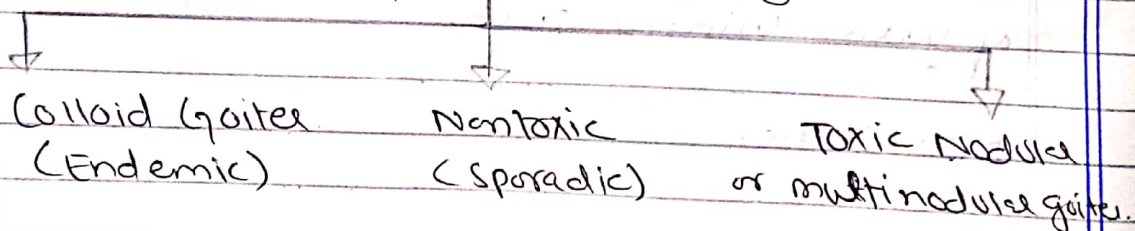
Q4 Briefly describe the types, causes, diagnosis and treatment of goiter?

GOITER:0

A condition that increases the size of your thyroid is called a goiter.

Thyroid is a butterfly-shaped gland located at the base of your neck just below your Adam's apple. Goiter is more often due to the over or under production of the thyroid hormones or to nodules in the gland itself.

4: TYPES OF GOITER:0



Colloid Goiter:0

A colloid goiter develops from the lack of iodine a mineral essential to the production of thyroid hormones. People who get this type of goiter usually live in areas where iodine is scarce.

Nontoxic (Sporadic):0

- The cause of a nontoxic goiter is usually unknown though it may be caused by medications like lithium. Lithium is used to treat mood disorders such as a bipolar disorder. Non-toxic goiters don't affect the

production of thyroid hormone and thyroid function is healthy. They are also benign.

Toxic Nodular or multinodular Goiter

- This type of goiter forms one or more small nodules as it enlarges. The nodules produce their own thyroid hormone causing hyperthyroidism. It generally form as an extension of a simple goiter.

Causes:

- Iodine deficiency is the main cause of goiters. Iodine is essential to helping your thyroid produce thyroid hormone.

Graves Disease:

Graves disease occurs when your thyroid produces more thyroid hormone than normal. Which is known as hyperthyroidism. The excessive production of hormones makes the thyroid increase its size.

Hashimoto Disease:

When you have Hashimoto disease the thyroid ~~doesn't~~ produce enough thyroid hormone, causing hypothyroidism. The low thyroid ~~doesn't~~ hormone causes the pituitary gland to make more thyroid-stimulating hormone (TSH) which causes the thyroid to swell.

- Inflammation.
- Nodules.
- Thyroid cancer.
- Pregnancy.

DIAGNOSIS:

Doctor will check for swelling. They will also order a number of diagnostic tests.

• Blood Tests:

- Blood test can detect changes in hormones levels and an increased production of antibodies which are produced in response to an infection or injury.

• Thyroid Scan:

Your doctor may order scans of your thyroid. This scans show the size and condition of your goiter.

• Ultrasound:

An ultrasound produces images of your neck, the size of your goiter and whether there are nodules. overtime an ultrasound can show changes in those nodules and the goiter.

Biopsy:

A biopsy is a procedure that involves taking small samples of your thyroid tissue. The samples are sent to a laboratory for examination.

TREATMENT:

Medications:

If you have hypothyroidism or hyperthyroidism medications to treat these conditions may be enough to shrink a goiter. Medication to reduce your inflammation may be used

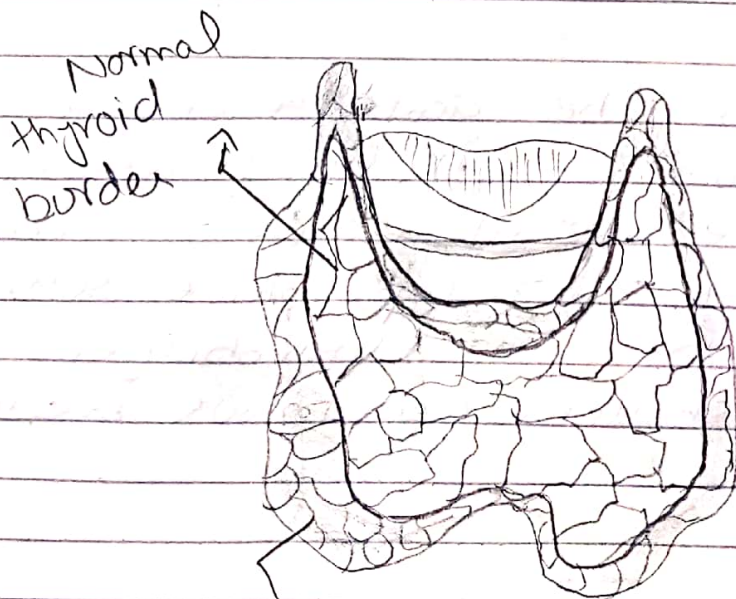
if you have thyroiditis.

Surgery

Surgical removal of your thyroid. known as thyroidectomy is an option if yours grows too large or doesn't respond to medication therapy.

Radioactive Iodine

In people with toxic multinodular goiters RAI may be necessary. The RAI is ingested orally and then travels to your thyroid through your blood, where it destroys the excess tissue.



Enlarged thyroid

Q5 write a detail note on Atelectasis, bronchiectasis and pneumonia?

Atelectasis:

- Atelectasis is defined as the collapse or closure of the lung resulting in reduced or absent gas exchange. It may affect part or all of the one lung.
- Atelectasis is the collapse of alveoli or lung tissue.
- It develops when the alveoli become airless from absorption of their air without replacement of the air with breathing.
- Atelectasis may be acute or chronic.
- The most commonly described atelectasis is ~~acute~~ acute atelectasis which occurs frequently in the postoperative setting or in people who are immobilized and have a shallow, monotonous breathing pattern.

Cause:

- Obstruction of an airway.
- Diminished distention of alveoli
- Extrinsic Compression on an airway.
- Enlarged lymph nodes that compress the airway or
- Masses in the chest that compress the airway or alveoli.
- Altered breathing Patterns.
- Nutritional Support.
- Fluid & electrolyte management.

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- Retained secretions.
- Pain, alterations in small airways.

4. Pathophysiology

- Reduced alveolar ventilation or any type of blockage.



- Impedes the passage of air



- The trapped alveolar air becomes absorbed into the bloodstream, but outside air cannot replace the absorbed air because of the blockage.



- Isolated portion of the lung becomes airless and the alveoli collapse.



- Excessive pressure on the lung tissue



- Restricts normal lung expansion on inspiration.



- Becomes airless for prolonged period



- Alveolar collapse.

Diagnostic

- Chest X-ray.
- Pulse oximetry.
- Physical examination.

BRONCHIECTASIS:

- Bronchiectasis is a condition anatomically defined by chronic, irreversible dilation and distortion of the bronchi caused by inflammatory destruction of the muscular and elastic components of the bronchial walls.

Causes:

- 1 Postinfective.
 - Bacterial pneumonia.
 - Tuberculosis.
 - pertussis
 - measles.
- 2 Proximal airway obstruction.
 - Foreign body aspiration.
 - Benign airways tumors.
 - Middle lobe Syndrome.
- 3 Abnormal host defense.
- 4 Genetic disorders.
- 5 others.

Pathology:

- Dilation and distortion of the bronchi
- Damage of airways epithelium.
- Dilation and hyperplasia of blood capillary.

Diagnosis:

- lung abscess
- X-ray / CT: local infiltrated shadow or cavitation with air-fluid level inside.

- Tuberculosis
radiographic finding, Sputum anti-fast smear.

Treatments

- 1 Improving the drainage of airway
- 2 Antibiotics.
- 3 Surgical therapy
- 4 management of hemoptysis.

PNEUMONIA ID

- An inflammatory process in lung parenchyma usually associated with a marked increase in interstitial and alveolar fluid.

Causes

- Bacteria, viruses, mycoplasmas, fungal agents & protozoa.
- Aspiration of food, fluids / vomitus.
- Inhalation of toxic / caustic chemicals smoke, dusts / gases.
- Influenza.

↳ Path-physiology
offending organism / agent.

↓
Inflammatory Pulmonary response

↓
lose defense mechanism of the lung.

↓
Allow organisms to penetrate the sterile LRT

↓
Develop Inflammation.



Disruption of the mechanical defenses

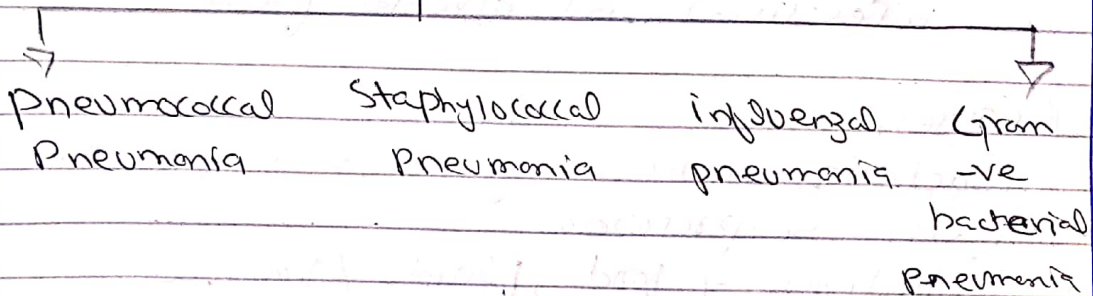
↓
Colonization of the lungs

↓
Inflamed & blood-filled alveolar sac.

↓
Alveolar exudates tends to consolidate.

↓
Difficult to expectorate

Types:



- Anaerobic bacterial pneumonia
- Legionnaires disease.

Diagnosis

- Sputum culture analysis & sensitivity.
- Fiber optic bronchoscopy.
- Skin test.
- Blood & urine cultures.
- Chest X-ray examination.

Treatment

- Specific antibiotic therapy:
- Respiratory support.